

WHAT IS CLAIMED IS:

1. In a system comprising a network and at least one mobile station (MS) for enabling communications with the at least one MS, a method for rescuing one or more MSs having connections with the network that have become potentially failing connections,  
5 comprising:

identifying the one or more MSs having potentially failing connections;  
transmitting a forward multiple-access rescue channel (RC-MA) from the network, the RC-MA including a rescue channel multiple-access synchronization message (RC-MAS) comprising MS identification and handoff information specific to each of the one or more  
10 MSs having potentially failing connections;

receiving the RC-MA at the one or more MSs having potentially failing connections; and

handing off the one or more MSs having potentially failing connections in accordance with the MS identification and handoff information.

2. The method as recited in claim 1, further including:

detecting when the one or more MSs having potentially failing connections are rescued; and

dynamically updating the RC-MAS as the one or more MSs having potentially failing connections are rescued and new MSs having potentially failing connections are identified, such that the RC-MAS only contains MS identification and handoff information specific to those MSs currently having potentially failing connections.

3. The method as recited in claim 1, further including scrambling the RC-MA using a rescue channel long code mask (RC-LCM) so that only those MSs having the RC-LCM can successfully demodulate the RC-MA.

4. The method as recited in claim 1, further including generating the RC-MA using a rescue channel orthogonal code (RC-OC).

5. The method as recited in claim 3, further including generating the RC-LCM using a rescue channel number (RCN) and parameters common to a region of the network.

6. The method as recited in claim 1, the RC-MA further including a rescue channel handoff message (RC-HO) comprising a new active set specific to each of the one or more MSs having potentially failing connections for enabling the MSs having potentially failing connections to continue the connection.

7. The method as recited in claim 6, further including identifying one or more sectors that were receiving a particular MS having a potentially failing connection with a higher signal strength than other sectors, and specifying those one or more sectors in the new active set specific to that particular MS.

8. The method as recited in claim 1, the RC-MA further including encrypted data specific to each of the one or more MSs having potentially failing connections for enabling communications with the one or more MSs having potentially failing connections while the one or more MSs having potentially failing connections are receiving the RC-MA.

9. The method as recited in claim 1, further including sequentially transmitting the specific RC-MAS messages to the one or more MSs having potentially failing connections.

10. The method as recited in claim 1, further including gating off the RC-MA when no MSs having potentially failing connections are identified.

11. The method as recited in claim 1, further including receiving the RC-MA from multiple sectors simultaneously.

12. The method as recited in claim 1, further including:  
transmitting a reverse rescue channel from each of the one or more MSs  
having potentially failing connections;  
receiving the reverse rescue channel from the one or more MSs having  
5 potentially failing connections at the network; and  
wherein the RC-MAS comprises MS identification and handoff  
information specific only to those MSs from which a reverse rescue channel was received at the  
network.

13. The method as recited in claim 12, further including generating the reverse  
10 rescue channel for a particular MS using a public or private long code mask presently in use for  
the connection of the particular MS.

14. In a system comprising a network and at least one mobile station (MS) for  
enabling communications with the at least one MS, one or more MSs capable of receiving a  
forward multiple-access rescue channel (RC-MA) and continuing connections that have become  
15 potentially failing connections, a method for assisting in rescuing one or more MSs having  
potentially failing connections, comprising:

identifying the one or more MSs having potentially failing connections;  
transmitting a forward multiple-access rescue channel (RC-MA) from the  
network, the RC-MA including a rescue channel multiple-access synchronization message (RC-  
20 MAS) comprising MS identification and handoff information specific to each of the one or more  
MSs having potentially failing connections;

monitoring a reverse channel specific to each of the one or more MSs  
having potentially failing connections in accordance with the MS identification and handoff  
information; and

25 transmitting one or more forward channels from the network, each  
forward channel in accordance with the MS identification and handoff information and specific  
to each of the one or more MSs having potentially failing connections that has received the RC-  
MA.

15. The method as recited in claim 14, further including:  
 detecting when the one or more MSs having potentially failing  
 connections are rescued; and  
 dynamically updating the RC-MAS as the one or more MSs having  
 5 potentially failing connections are rescued and new MSs having potentially failing connections  
 are identified, such that the RC-MAS only contains MS identification and handoff information  
 specific to those MSs currently having potentially failing connections.

16. The method as recited in claim 14, further including scrambling the RC-  
 MA using a rescue channel long code mask (RC-LCM) so that only those MSs having the RC-  
 10 LCM can successfully demodulate the RC-MA.

17. The method as recited in claim 14, further including generating the RC-  
 MA using a rescue channel orthogonal code (RC-OC).

18. The method as recited in claim 16, further including generating the RC-  
 LCM using a rescue channel number (RCN) and parameters common to a region of the network.

19. The method as recited in claim 14, the RC-MA further including a rescue  
 channel handoff message (RC-HO) comprising a new active set specific to each of the one or  
 more MSs having potentially failing connections for enabling the MSs having potentially failing  
 connections to continue the connections.

20. The method as recited in claim 19, further including identifying one or  
 20 more sectors that were receiving a particular MS having a potentially failing connection with a  
 higher signal strength than other sectors, and specifying those one or more sectors in the new  
 active set specific to that particular MS.

21. The method as recited in claim 14, the RC-MA further including  
 encrypted data specific to each of the one or more MSs having potentially failing connections for  
 25 enabling communications with the one or more MSs having potentially failing connections while  
 the one or more MSs having potentially failing connections are receiving the RC-MA.

22. The method as recited in claim 14, further including sequentially transmitting the specific RC-MAS messages to the one or more MSs having potentially failing connections.

23. The method as recited in claim 14, further including gating off the RC-MA when no MSs having potentially failing connections are identified.

24. The method as recited in claim 14, further including transmitting the RC-MA from multiple sectors simultaneously.

25. The method as recited in claim 14, wherein each of the one or more MSs having potentially failing connections transmits a reverse rescue channel, the method further including:

receiving the reverse rescue channel from the one or more MSs having potentially failing connections at the network;

wherein the RC-MAS comprises MS identification and handoff information specific only to those MSs from which a reverse rescue channel was received at the network.

26. In a system comprising a network and at least one mobile station (MS) for enabling communications with the at least one MS, the network capable of transmitting a forward multiple-access rescue channel (RC-MA) including a rescue channel multiple-access synchronization message (RC-MAS) comprising MS identification and handoff information specific to each of one or more MSs having connections with the network that have become potentially failing connections, a method for assisting in rescuing a MS having a potentially failing connection, comprising:

receiving the RC-MA at the MS having the potentially failing connection;

and

transmitting a reverse channel specific to the MS having the potentially failing connection in accordance with the MS identification and handoff information.

27. The method as recited in claim 26, further including unscrambling the RC-MA using a rescue channel long code mask (RC-LCM).

28. The method as recited in claim 26, further including demodulating the RC-MA using a rescue channel orthogonal code (RC-OC).

5 29. The method as recited in claim 26, the RC-MA further including a rescue channel handoff message (RC-HO) comprising a new active set specific to the MS having a potentially failing connection, the method further including handing off the MS having the potentially failing connection in accordance with the new active set of the MS having the potentially failing connection.

10 30. The method as recited in claim 26, the RC-MA further including encrypted data specific to the MS having the potentially failing connection, the method further including maintaining communications with the MS having the potentially failing connection while the MS having the potentially failing connection is receiving the RC-MA.

15 31. The method as recited in claim 26, further including receiving the RC-MA from multiple sectors simultaneously.

32. The method as recited in claim 26, the network capable of receiving a reverse rescue channel from the MS having the potentially failing connection and wherein the RC-MAS comprises MS identification and handoff information specific only to those MSs from which a reverse rescue channel was received, the method further including:

20 transmitting the reverse rescue channel from the MS having the potentially failing connection.

33. The method as recited in claim 32, further including generating the reverse rescue channel for a particular MS using a public or private long code mask presently in use for the connection of the particular MS.

34. In a system comprising a network and at least one mobile station (MS) for enabling communications with the at least one MS, a method for handing off one or more MSs having a connection with the network prior to detecting a failing connection, comprising:

identifying the one or more MSs in need of handoff;

transmitting a forward multiple-access handoff channel (HC-MA) from the network, the HC-MA including a handoff channel multiple-access synchronization message (HC-MAS) comprising MS identification and handoff information specific to each of the one or more MSs in need of handoff;

receiving the HC-MA at one or more MSs in need of handoff; and

handing off the one or more MSs in need of handoff in accordance with the MS identification and handoff information.

35. The method as recited in claim 34, further including receiving the HC-MA from multiple sectors simultaneously.

36. In a system comprising a network and at least one mobile station (MS) having connections with the network for enabling communications with the at least one MS, the one or more MSs capable of receiving a forward multiple-access handoff channel (HC-MA) and continuing the connections, a method for assisting in handing off the one or more MSs prior to detecting potentially failing connections, comprising:

identifying the one or more MSs in need of handoff;

transmitting the HC-MA from the network, the HC-MA including a handoff channel multiple-access synchronization message (HC-MAS) comprising MS identification and handoff information specific to each of the one or more MSs in need of handoff;

monitoring a reverse channel specific to each of the one or more MSs in need of handoff in accordance with the MS identification and handoff information; and

transmitting one or more forward channels from the network, each forward channel in accordance with the MS identification and handoff information and specific to each of the one or more MSs in need of handoff that has received the HC-MA.

37. The method as recited in claim 36, further including transmitting the HC-MA from multiple sectors simultaneously.

38. A system for enabling communications between a network and at least one mobile station (MS) and for rescuing one or more MSs having connections with the network that have become potentially failing connections, the system comprising:

a network having a network processor programmed for identifying the one or more MSs having potentially failing connections,

transmitting a forward multiple-access rescue channel (RC-MA) from the network, the RC-MA including a rescue channel multiple-access synchronization message (RC-MAS) comprising MS identification and handoff information specific to each of the one or more MSs having potentially failing connections,

monitoring a reverse channel specific to each of the one or more MSs having potentially failing connections in accordance with the MS identification and handoff information, and

transmitting one or more forward channels from the network, each forward channel in accordance with the MS identification and handoff information and specific to each of the one or more MSs having potentially failing connections that has received the RC-MA; and

one or more MSs, each MS having a MS processor programmed for receiving the RC-MA and transmitting a reverse channel in accordance with the MS identification and handoff information if that MS has potentially failing connection.



39. The system as recited in claim 38, the network processor further programmed for:

detecting when the one or more MSs having potentially failing connections are rescued; and

5 dynamically updating the RC-MAS as the one or more MSs having potentially failing connections are rescued and new MSs having potentially failing connections are identified, such that the RC-MAS only contains MS identification and handoff information specific to those MSs currently having potentially failing connections.

40. The system as recited in claim 38, the network processor further  
10 programmed for scrambling the RC-MA using a rescue channel long code mask (RC-LCM) so that only those MSs having the RC-LCM can successfully demodulate the RC-MA.

41. The system as recited in claim 38, the network processor further programmed for generating the RC-MA using a rescue channel orthogonal code (RC-OC).

42. The system as recited in claim 40, the network processor further  
15 programmed for generating the RC-LCM using a rescue channel number (RCN) and parameters common to a region of the network.

43. The system as recited in claim 38, the RC-MA further including a rescue  
20 channel handoff message (RC-HO) comprising a new active set specific to each of the one or more MSs having potentially failing connections for enabling the MSs having potentially failing connections to continue the connection.

44. The system as recited in claim 43, the network processor further programmed for identifying one or more sectors that were receiving a particular MS having a potentially failing connection with a higher signal strength than other sectors, and specifying those one or more sectors in the new active set specific to that particular MS.

45. The system as recited in claim 38, the RC-MA further including encrypted data specific to each of the one or more MSs having potentially failing connections for enabling communications with the one or more MSs having potentially failing connections while the one or more MSs having potentially failing connections are receiving the RC-MA.

5 46. The system as recited in claim 38, the network processor further programmed for sequentially transmitting the specific RC-MAS messages to the one or more MSs having potentially failing connections.

47. The system as recited in claim 38, the network processor further programmed for gating off the RC-MA when no MSs having potentially failing connections are  
10 identified.

48. The system as recited in claim 38, the MS processor further programmed for receiving the RC-MA from multiple sectors simultaneously.

49. The system as recited in claim 38, the network processor further programmed for transmitting the RC-MA from multiple sectors simultaneously.

15 50. The system as recited in claim 38:  
the MS processor of each of the one or more MSs further programmed for transmitting a reverse rescue channel from that MS if that MS has a potentially failing connection; and

the network processor further programmed for receiving the reverse rescue  
20 channel from MSs having potentially failing connections at the network;

wherein the RC-MAS comprises MS identification and handoff information specific only to those MSs from which a reverse rescue channel was received at the network.

25 51. The system as recited in claim 50, the MS processor of a particular MS further programmed for generating the reverse rescue channel for the particular MS using a public or private long code mask presently in use for the connection of the particular MS.

52. A system for enabling communications between a network and at least one mobile station (MS) and for assisting in rescuing one or more MSs having potentially failing connections, the one or more MSs capable of receiving a forward multiple-access rescue channel (RC-MA) and continuing connections that have become potentially failing connections, the system comprising:

a network including a network processor programmed for identifying the one or more MSs having potentially failing connections,

transmitting a forward multiple-access rescue channel (RC-MA), the RC-MA including a rescue channel multiple-access synchronization message (RC-MAS) comprising MS identification and handoff information specific to each of the one or more MSs having potentially failing connections,

monitoring a reverse channel specific to each of the one or more MSs having potentially failing connections in accordance with the MS identification and handoff information, and

transmitting one or more forward channels from the network, each forward channel in accordance with the MS identification and handoff information and specific to each of the one or more MSs having potentially failing connections that has received the RC-MA.

53. The system as recited in claim 52, the network processor further programmed for:

detecting when the one or more MSs having potentially failing connections are rescued; and

dynamically updating the RC-MAS as the one or more MSs having potentially failing connections are rescued and new MSs having potentially failing connections are identified, such that the RC-MAS only contains MS identification and handoff information specific to those MSs currently having potentially failing connections.

54. The system as recited in claim 52, the network processor further programmed for scrambling the RC-MA using a rescue channel long code mask (RC-LCM) so that only those MSs having the RC-LCM can successfully demodulate the RC-MA.

55. The system as recited in claim 52, the network processor further  
5 programmed for generating the RC-MA using a rescue channel orthogonal code (RC-OC).

56. The system as recited in claim 54, the network processor further programmed for generating the RC-LCM using a rescue channel number (RCN) and parameters common to a region of the network.

57. The system as recited in claim 52, the RC-MA further including a rescue  
10 channel handoff message (RC-HO) comprising a new active set specific to each of the one or more MSs having potentially failing connections for enabling the MSs having potentially failing connections to continue the connections.

58. The system as recited in claim 57, the network processor further  
15 programmed for identifying one or more sectors that were receiving a particular MS having a potentially failing connection with a higher signal strength than other sectors, and specifying those one or more sectors in the new active set specific to that particular MS.

59. The system as recited in claim 52, the RC-MA further including encrypted  
20 data specific to each of the one or more MSs having potentially failing connections for enabling communications with the one or more MSs having potentially failing connections while the one or more MSs having potentially failing connections are receiving the RC-MA.

60. The system as recited in claim 52, the network processor further programmed for sequentially transmitting the specific RC-MAS messages to the one or more MSs having potentially failing connections.

61. The system as recited in claim 52, the network processor further programmed for gating off the RC-MA when no MSs having potentially failing connections are identified.

62. The system as recited in claim 52, the network processor further  
5 programmed for transmitting the RC-MA from multiple sectors simultaneously.

63. The system as recited in claim 52, wherein each of the one or more MSs having potentially failing connections transmits a reverse rescue channel, the network processor further programmed for receiving the reverse rescue channel from the one or more MSs having potentially failing connections at the network;

10 wherein the RC-MAS comprises MS identification and handoff information specific only to those MSs from which a reverse rescue channel was received at the network.

64. A mobile station (MS) for communicating with a network and for assisting in rescuing the MS when the MS has a connection with the network that has become a  
15 potentially failing connection, the network capable of transmitting a forward multiple-access rescue channel (RC-MA) including a rescue channel multiple-access synchronization message (RC-MAS) comprising MS identification and handoff information specific to each of one or more MSs having connections with the network that have become potentially failing connections, the MS comprising:

20 a MS processor programmed for receiving the RC-MA at the MS if the MS has a potentially failing connection, and

transmitting a reverse channel in accordance with the MS identification and handoff information if the MS has a potentially failing connection.

25 65. The MS as recited in claim 64, the MS processor further programmed for unscrambling the RC-MA using a rescue channel long code mask (RC-LCM).

66. The MS as recited in claim 64, the MS processor further programmed for demodulating the RC-MA using a rescue channel orthogonal code (RC-OC).

67. The MS as recited in claim 64, the RC-MA further including a rescue channel handoff message (RC-HO) comprising a new active set specific to each of the one or more MSs having potentially failing connections, the MS processor further programmed for handing off the MS to the new connection in accordance with the new active set specific to the MS if the MS has a potentially failing connection.

68. The MS as recited in claim 64, the RC-MA further including encrypted data specific to one or more MSs having potentially failing connections, the MS processor further programmed for using the encrypted data to maintain communications while the MS is receiving the RC-MA, if the MS has a potentially failing connection.

69. The method as recited in claim 64, the MS processor further programmed for receiving the RC-MA from multiple sectors simultaneously.

70. The MS as recited in claim 64, the network capable of receiving a reverse rescue channel from one or more MSs having potentially failing connections and wherein the RC-MAS comprises MS identification and handoff information specific only to those MSs from which a reverse rescue channel was received, the MS processor further programmed for:

transmitting the reverse rescue channel from the MS if the MS has a potentially failing connection.

71. The MS as recited in claim 70, the MS processor further programmed for generating the reverse rescue channel for the MS using a public or private long code mask presently in use for the connection of the MS.

72. A system for enabling communications between a network and at least one mobile station (MS) and for handing off one or more MSs having a connection with the network prior to detecting a failing connection, comprising:

a network including a network processor programmed for  
 identifying the one or more MSs in need of handoff,  
 transmitting a forward multiple-access handoff channel (HC-MA)  
 from the network, the HC-MA including a handoff channel multiple-access synchronization  
 message (HC-MAS) comprising MS identification and handoff information specific to each of  
 the one or more MSs in need of handoff,

monitoring a reverse channel specific to each of the one or more  
 MSs in need of handoff in accordance with the MS identification and handoff information, and  
 transmitting one or more forward channels from the network, each  
 forward channel in accordance with the MS identification and handoff information and specific  
 to each of the one or more MSs in need of handoff that has received the HC-MA; and

a MS including a MS processor programmed for  
 receiving the HC-MA at one or more MSs in need of handoff, and  
 transmitting a reverse channel from the one or more MSs in need  
 of handoff in accordance with the MS identification and handoff information.

73. The system as recited in claim 72, the MS processor further programmed  
 for receiving the HC-MA from multiple sectors simultaneously.

74. A system for enabling connections between a network and at least one mobile station (MS) and assisting in handing off one or more MSs prior to detecting potentially failing connections, the one or more MSs capable of receiving a forward multiple-access handoff channel (HC-MA) and continuing the connections, the system comprising:

- 5 a network including a network processor programmed for
  - identifying one or more MSs in need of handoff,
  - transmitting the HC-MA from the network, the HC-MA including
- a handoff channel multiple-access synchronization message (HC-MAS) comprising MS
- identification and handoff information specific to each of the one or more MSs in need of
- 10 handoff,
  - monitoring a reverse channel specific to each of the one or more
  - MSs in need of handoff in accordance with the MS identification and handoff information, and
  - transmitting one or more forward channels from the network, each
  - forward channel in accordance with the MS identification and handoff information and specific
  - 15 to each of the one or more MSs in need of handoff that has received the HC-MA.

75. The method as recited in claim 74, the network processor further programmed for transmitting the HC-MA from multiple sectors simultaneously.